Quandong

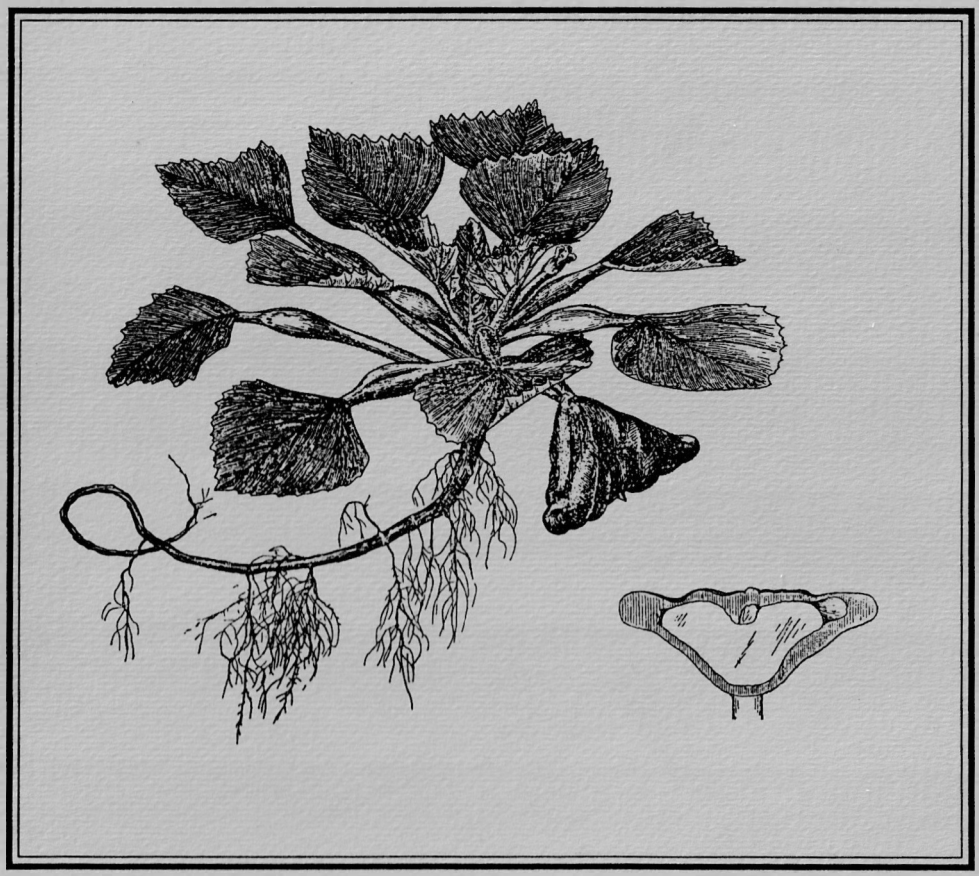
magazine of the

West Australian Nut & Tree Crop Association (Inc)

February/March 1989

Vol 15 No 1 • ISSN 0312-8989 • $2.00

Registered by Australia Post : Publication WBH0868



THE EUROPEAN WATER CHESTNUT *(Trapa bicornis)*

COME TO THE VIDEO SHOW

Our **NEXT MEETING** will be largely devoted to the showing of some very interesting videos. The date and time:

Wednesday, February 15 — 7.30 pm

Venue: Naturalists Hall, 63 Merriwa St, Nedlands.

Videos to be shown include:

- **Wheat Today, What Tomorrow?** – David Bellamy's gripping story of the decline and planned reclamation of our arid wheat-lands.
- **The Macadamia** — A short, but very informative review of the rapidly-expanding macadamia industry on Australia's East coast.
- **Green Envoys** — CSIRO's story of how Australian trees have revolutionized forestry overseas, with China and Zimbabwe as examples.
- **The Tagasaste Story** — Wesfarmers' video of the rise of this tree crop in W.A.

Further videos will be shown if there is the time and demand, including CSIRO's 'A Curious and Diverse Flora', reviewing our botanical resources.

Visitors will be very welcome — admission is free

STONEVILLE FIELD DAY

A very important Field Day date: Sunday, March 12 at the Stoneville Fruit Research Station, Stoneville. Meet 12.30.

Full details are in the special leaflet with this issue of Quandong, or from the Tree Crops Centre.

[NSW Dept. Agric. Agfact H3.1.41, 1983]

MACADAMIAS - A SUMMARY OF CULTURAL REQUIREMENTS AND ECONOMICS

The macadamia (Macadamia integrifolia and M. tetraphylla) is the only Australian native tree so far developed as a commercial food crop. It is indigenous to the coastal areas of northern New South Wales and southern Queensland between latitudes 25° and 32°S. Lismore, centre of the main New South Wales growing area, has a latitude of 28°S.

Selecting from several trees introduced from Australia in the 1870s, Hawaii has established an industry with 4,000 ha of trees annually producing 13,400 t of nuts in shell. There are extensive plantings in South Africa, Zimbabwe, Kenya, California and Central America.

Since 1970 the area under macadamias in New South Wales has expanded rapidly to 2,200 ha (1982) and further expansion seems assured. Large plantings have also been made in southern Queensland, especially in the 1970s. More recently, plantings have been made on the Atherton Tableland in far north Queensland, and further plantings there are expected because of the availability of large tracts of suitable land.

Potential

The world's main producer of macadamias, Hawaii, has been able to cater for its own market and part of the U.S. mainland market. Consignments of nuts have also been sent to Japan. There is also considerable interest in Europe in macadamias and small quantities sent from Australia to Canada, Japan, Singapore, Hong Kong, France, Germany, Sweden and Norway have met a keen demand. The export potential is, however, still largely unknown.

It is difficult to estimate the Australian demand for a product which, until now, has been in very small supply. An increase in the supply of macadamia nuts in Australia should result partly in a substitution of

macadamia nuts for other nuts and partly in an increase in the total consumption of tree nuts, including macadamias. For many people, macadamia nuts have a distinctive taste for which there is no substitute.

Table 1. Estimated costs and returns (per hectare)

Year	Yield	Gross return	Direct costs	Annual gross margin	Cumulative gross margin
		(A)	(B)	(A-B)	
	kg	$	$	$	$
1			1,800	-1,800	-1,800
2			450	- 450	-2,250
3			450	- 450	-2,700
4			450	- 450	-3,150
5			450	- 450	-3,600
6	600	1,200	1,300	- 100	-3,700
8	1,200	2,400	1,600	800	-2,900
10	2,400	4,800	2,100	2,700	- 200
12	3,000	6,000	2,600	3,400	3,200
14	3,750	7,500	2,850	4,650	7,850

The macadamia offers long-term economic potential, but is most suited to investors with large capital resources. Currently (mid-1983) 10 to 12 ha appears to be the minimum viable area.

Site and soil

Macadamias need a site that is frost-free. It should also be sheltered so as to protect the shallow-rooted tree, enhance production and reduce limb breakages. The trees grow well on reasonably well-drained volcanic soil but site selection for drainage is not as critical as for avocados or custard apples. Large harvesting and spray equipment require gentler slopes. Light to medium loams are preferred, at least 0.5m deep, and with a pH of 5 to 5.5.

Land preparation

Using a bulldozer or similar equipment, sweep the area clear of rocks, stumps and unwanted bush. The area can then be pegged out into tree rows and herbicide applied to a strip about 2m wide along each row. When

the vegetation has died apply dolomite or agricultural lime, zinc sulphate and copper sulphate to these strips and deep rip (say 60cm). Allow 3 to 12 months for land preparation before planting.

Planting distances

Planting distances depend on soil conditions and the variety of tree to be planted. Varieties with a tendency to grow upright, such as 660 and 344, can be planted closer together than those with a spreading habit, such as 246 and 508. Likewise, in the poorer soils trees can be planted closer together and in good soils wider apart.

An average planting for spreading trees such as 246 on the red soils of the Lismore district is 10m x 5m, giving 200 trees/ha. At this spacing, every second tree would be removed at about year 12 when crowding occurs. Upright varieties could be planted at 9.4m x 4m, giving 265 trees/ha. The question of planting distances is complex and requires major consideration. Grafted trees ready for planting cost $5 to $8 each.

Irrigation

Irrigation is required during early establishment and on cropping trees from flowering through fruit set to harvest (September to late March). Under-tree microjets are the most suitable means of irrigating.

Fertilizers

Approximately 450g of a 10:2:17 NPK mixture is required per tree for each year of age, up to a maximum of 5kg, split into two applications. Apply extra nitrogen in the first 3 years. One-year-old trees could receive 30g of urea, 2-year-old trees 45g and 3-year-old trees 60g every 6 to 8 weeks between September and March. Zinc, copper and magnesium deficiencies commonly occur and these elements may have to be supplied; boron also may be required

Labour

One man can manage 20ha for the first 4 to 5 years, and this includes spraying, irrigation, fertilizing and mowing. In years 6 to 8 casual labour will be required for harvesting. From year 9 or 10 onwards a greater labour input will be required for harvesting, or machines will have to be used.

Time to first commercial crop

A light crop can be expected 4 to 5 years after planting and commercial yields 2 to 3 years later, depending on variety.

Yields

With insufficient areas yet in full production, Australia lacks the records that would enable accurate yield assessments to be made. However, it appears likely that some of the present varieties will yield about 35kg of nuts in shell per tree at full maturity.

Bearing life

Seedling orchards have survived over 100 years but there are insufficient old grafted plantings in Australia to allow an assessment of the productive life of macadamia orchards. It is expected to be 20 to 40 years.

Economics

Price. Growers receive approximately $2/kg for nuts in shell, but this depends on kernel recovery and quality.

Capital. Capital requirements are high because of the large scale of operation and mechanization. Over $400,000 is required to purchase and develop 20ha to bearing age. Land (20ha) $100,000, preparation $20,000, trees $1,600/ha, irrigation $2,500/ha, shed $10,000, tractor and equipment $20,000, plus other minor equipment and operating expenses for items such as fertilizers, pesticides, mowing and windbreaks.

Costs and returns. An estimate of costs and returns for years 1 to 14 is give in table 1.

F.C. Chalker, M.R. Loebel, and T. Trochoulias

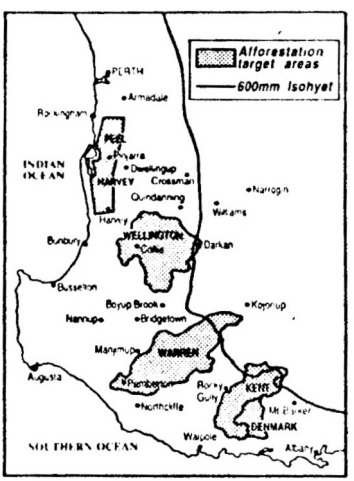
[West Australian , December 16, 1988]

$ 325M SCHEME TO 'GREEN' SW

The Premier, Mr Dowding, yesterday launched a $325 million program involving the planting of more than 100 million trees to "green" the South-West.

The 20-year scheme will be known as the Tree Trust, and will have a two-pronged benefit. The scheme will correct the environmental damage caused by extensive land clearing. It will also boost the timber industry, with the potential to generate more than $350 million a year in exports and create 4,000 jobs within 10 years.

The industry will commit an initial $1 million to launch the trust. The Government, through the Department of Conservation and Land Management, will have a 20 per cent interest. But this will be based on the contribution already made and a commitment to establish and manage the plantations under contract. No taxpayers' money will be invested.



Mr Dowding announced the trust — which would "change the face of the South-West" — on an inspection of a forest regeneration area in the Wellington region near Collie. The decision to proceed follows a successful pilot project involving the planting of Tasmanian blue gums on 2,000ha of land, mainly in the Peel Inlet area, last winter.

It was proposed to plant a further 5,000ha next winter, building up to 10,000ha in 1990, with an average of 1,000 seedlings being planted on each hectare. The Premier said the pilot scheme had shown that tree planting could be highly profitable and that WA was well placed to capitalise on growing world demand for quality wood fibre.

Although the participation of farmers was voluntary, the response had been enthusiastic and adequate land had already been volunteered for next year. He said the long-term environmental benefits would include:

- A big regional contribution to reducing the Greenhouse Effect.
- Cutting salinity and boosting the region's fresh water supply.
- Reducing phosphate pollution, especially in the Peel-Harvey Inlet.

Peter Kennedy

UNUSUAL FRUITS STILL AVAILABLE

There are still a few plants available from the WANATCA Special offer. These include Date palm ($10), Casiminoa ($10), Wampee ($8), Tea ($8) and Carambola ($8).
They are available through Blossom's Garden Centre and WANATCA members can get 25% discount - contact Anne on 398 1315

[West Australian, December 26 1988]

THE ROSE APPLE IN PERTH

Having previously read about *Syzygium jambos*, or the Rose Apple, I considered it probably too touchy to introduce into the metropolitan area.

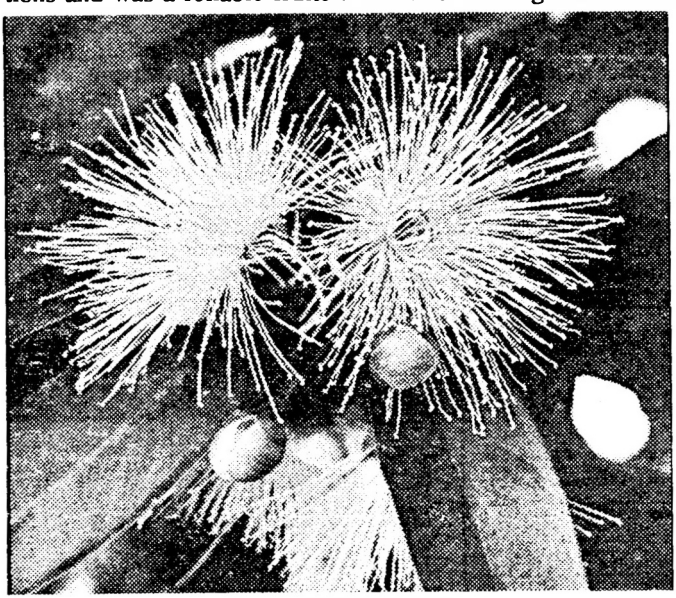
However, it turns out that a few plants managed to get into our system through incorrect naming, a common problem with the myrtle family fruits - even botanists have bun fights overy which plants are which and appropriate names.

A small number of plants we did obtain grew through their first winter very successfully. A couple of months ago I was in a garden in Gosnells, checking out a mango tree that was coming into flower. There in the corner was a 20-year-old Rose Apple that was not only thriving, but putting on a magnificent show of bright-pink and burgundy-red new foliage.

On questioning the owner, I found that the tree was untroubled by winter conditions and was a reliable fruiter. All this caused me to go back and check references, and it appears that this variety is a very adaptable plant. While it originated in India and parts of Malaysia, it has been widely cultivated throughout South-East Asia for many centuries.

Like most of the fruiting myrtles, it's got a list of names as long as your arm. In Malaysia it's known as Jumbu Mauwar, in China as Pau Tao, was botanically known as *Eugenia jambos* and it has also picked up the name of "Malabar Plum".

The Rose Apple is a superbly ornamental small tree that can grow to six metres high and tends to have low spreading, even weeping, branches. The spring foliage is a real treat and makes a spectacular crimson show in the garden. As the leaves mature they turn a dark glossy green.



Rose Apple Flowers

Flowers usually start to form in early summer and are white to cream in colour and around 8-9cm across. They're sweetly scented and make a spectacular show as they pop out all over the tree. Rather than having a single crop of flowers, it's common for these fruits to produce flowers and fruits over a six-month period.

The fruits are round with a diameter of 3-5cm. When ripe they are

a dull yellow colour, sometimes blushed with pink. The flesh is fairly thin and surrounds a hollow where two or three seeds can rattle around. This flesh is white and firm and has a delightful rose scent. The quality varies quite a bit — poor fruits are dry and uninteresting and better quality ones sweet and moist. All are rich in vitamin C.

Rose Apples are generally eaten raw and are a real favourite throughout Indonesia. Alternatively, they can be cooked with sugar or sliced up and mixed in fruit salads. Full-size, but still green, the fruits have a high pectin content, and when mixed with acid fruits such as cape gooseberries, make superb jams and jellies. Two or three ripe fruits can be added to custard during cooking to give a delightful rose flavour.

Rose Apple is well known to Chinese herbalists, who recommend the flesh for curing hiccups and stomach pains related to diarrhoea. Even the seeds play a part in medicines — they are broiled to create charcoal and this is used as a wound dressing.

The Rose Apple will thrive under tropical conditions where there is a low frost risk and is a very adaptable tree that will succeed in cooler sub-tropical areas. It demands good drainage, and our sandy metropolitan soils would be ideal, with the addition of a high percentage of organic material. It's important to choose a sunny spot, preferably open to the north or west, to take advantage of any winter sunlight.

It could well be that the Rose Apple has a link with Australian history. When Captain Cook tasted his first fruits on Australian soil, from a lillypilly, he is said to have remarked that it had a Jambos-like flavour. It's likely he was referring to the Rose Apple, as it was well known and widely distributed throughout South-East Asia in those early times.

While the fruit quality is not always outstanding, the Rose Apple is a first-class feature tree that can serve a number of purposes in the garden. It makes a good screen and a dense shade specimen.

Neville Passmore

SUBSCRIPTION RATES HELD DOWN

After reviewing the Association's finances, the Executive Committee have resolved to keep the 1989 membership rates at the same level as last year (basic rate $30.00 p.a.).

However, the Association is under pressure from continuing price rises, and an increase is foreshadowed for 1990. Members would be well advised to consider renewing for 3 years in advance, or applying for life membership, at the current low rates (unchanged for 3 years).

"DIVERSITY IN TREE CROPS" NEW ZEALAND CONFERENCE

The New Zealand Tree Crops Association are holding a Conference with the above theme on 13- 15 May 1989 at Blenheim, Malborough (northern part of South Island). Any reader visiting New Zealand around that time would find it well worthwhile to include the conference on their itinerary. Details are available from the Tree Crops Centre.

[West Australian , November 19 1988]

FAST FOLIAGE AND FERMENTED FUNGUS

An unlisted Perth company has positioned itself between world-beating biotechnology research and the CSIRO to commercialise a new process which it is claimed has the potential to revolutionise the economics of forestry management.

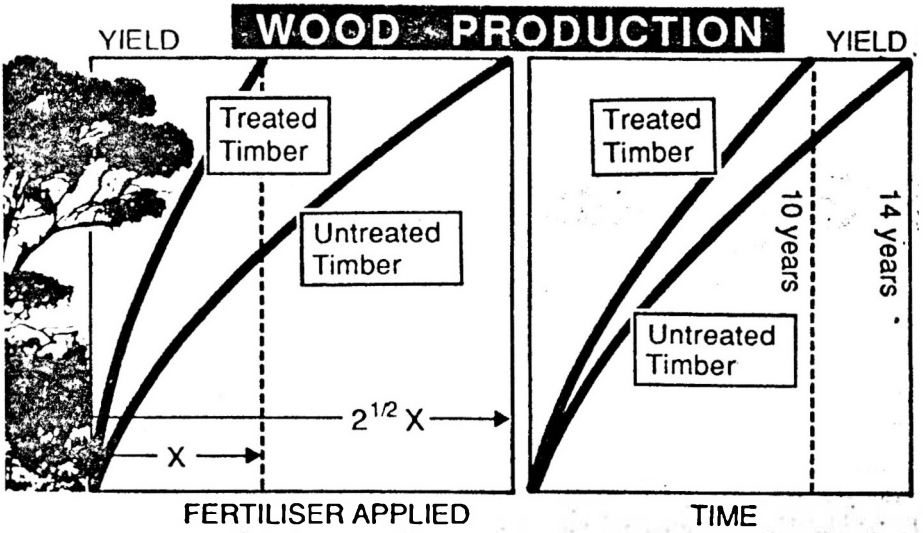
Research has shown the process, which involves impregnating trees with growth-enhancing fungi on seed germination, can enhance tree growth by up to 40 per cent, or alternatively reduce fertiliser use by two-and-a-half times. This means turn-around time for tree growth for wood chip or pulp manufacture can be reduced from about 14 years to less than 10.

It could make trees an acceptable rotation crop for farmers, and swing the balance in favour of wood production away from clear felling of natural timber. The process has already aroused the interest of multinational company, Shell, and it will soon face limited commercial trials through Alcoa of Australia, which runs a major reafforestation operation alongside its southwest alumina operation.

The basis of the process stems from eight years of research conducted by the Commonwealth Scientific and Industrial Research Organisation into ectomycorhizal (pron: ec-to-my-co-ri-sal) fungi. The benefits of these fungi — which are present in all soils — have been known for decades. But CSIRO research, under the guidance of Dr Nicholas Malajczuk, has shown that some strains of fungi work best on specific plant species in specific areas.

However, the problem confronting the CSIRO has been that of finding an efficient method of delivering the fungi to trees during germination. The solution has been provided by Clem Kuek, a Malaysian scientist who studied the production of a biological delivery system during his PhD studies at the University of Western Australia.

As with all biotechnology products, it is the delivery system that is of prime importance in the commercial sense. Dr Kuek has found a way of encasing the fungi in hydrogel beads, using fermentation techniques. The beads containing the fungi are planted along with the tree seeds, and research has demonstrated an almost 100 per cent success rate in the products inoculating test seedlings. Standing between the CSIRO



and Clem Kuek to commercialise the process is Perth businessman David Deane-Spread and his company Interbac, of which Dr Kuek is now a senior partner.

Mr Deane-Spread came across the beading technology developed by Dr Kuek while investigating another biotechnology project. The association was cemented when Australian immigration authorities tried to send Dr Kuek back to Malaysia when he completed his PhD studies. Mr Deane-Spread sponsored Dr Kuek's return to Australia under an employer sponsorship scheme.

Interbac has continued, through the University of Western Australia's Department of Soil Science, its research into the delivery system and at the same time entered an agreement with the CSIRO to use the strains of fungi identified by the Organisation as being most efficient.

This arrangement allows Interbac to quote the results of research by the CSIRO on its products. Interbac claims it is about three years ahead of all other delivery system developments in these fields.

Graham Lloyd

[Editor's Note: The Tree Crops Centre has discussed use of these techniques on nut and fruit trees with Interbac, and they are interested in this area of development.]

PROFESSOR ROGER UHLINGER TO VISIT

During March 12-15 this year, we expect to be visited by Prof. Roger Uhlinger of the Department of Horticulture, University of Nebraska, U.S.A.
Prof. Uhlinger is in Australia for several months, involved in a project at the Victorian Department of Agriculture's Knoxfield Research Station.
He is involved with vegetable production as well as nut crops. We hope that he will be able to be present at the Stoneville Field Day on March 12.

[Nut Grower, August 1988]

U.S. DROUGHT BOOSTS DEMAND FOR ALMOND HULLS

Marketers of almond hulls for cattle and dairy feed are enjoying a boom in prices on the cash and futures markets. Fueled by both "psychological and tangible" factors caused by the severe drought in the Midwest, prices have topped $70 a ton on the cash market, and futures on hulls to be delivered to Los Angeles in the fall have been traded for as high as $90 per ton, according to one broker.

"It's just all related to other feed commodities," said Roger C. Dunn of Cal By-Products, Orinda, Calif. "There is more demand than supply."

Dunn, who has traded in almond hulls and other feed sources for over 30 years, said prices began climbing in mid-May when they jumped from $45 to $65 in a two-week period. "The drought has caused psychological effects as well as tangible ones on these markets," he observed. Cash prices paid for hulls last summer were around $56 to $60, delivered, Dunn said.

Levels of $75 and $80 have been reached in years of small crops, noted David Swisshelm of Kempareil Inc., Wasco, Calif., but the recent highs on the cash market have been for hulls from the abundant 1987 crop. "The volatile market we have right now is unbelievable," he said. "It's reaching levels that haven't been reached since 1983."

WANATCA ACTIVE IN 1989 ROYAL SHOW

The Association expects to play an active role in this year's Royal Show, to be held at Claremont from Sept 30 - Oct 7. We hope to show nut craking equipment in operation, have a display of unusual fruits and nuts, and possibly have trees for sale.

Anyone with suggestions or offers of involvement, please contact David Noel, who represents us on the Show Committee.

[West Australian, December 30 1988]

Gum trees growing into an export crop

The old-fashioned hoe is still a vital tool for WA's farming knight, Sir Donald Eckersley, of Harvey. But it is not as a soil tiller that the hoe is important.

It is a protector against snakes in the thick grass of Sir Donald's 130 hectare block. As well, it allows him to check the height of newly planted trees — the latest agricultural pursuit of the 66-year-old former dairy farmer.

ing, with less work, and sheep and cattle could be reintroduced after an establishment period for the trees.

Under the scheme, cash payments were made to the farmer in the first year. As well, tree planting generally would help correct environmental damage due to clearing. "I believe trees will be as important as cereal crops in the future," Sir Donald said. He estimated plantings under the scheme this

Sir Donald Eckersley checks one of his 50,000 blue gums

Sir Donald is a pioneer in WA farming with an agreement with the Department of Conservation and Land Management to grow *Eucalyptus globulus* (Tasmanian Blue Gum). Last July about 50,000 trees were planted on his property, with another 25,000 to 30,000 planned for next winter.

Sir Donald believes that ultimately thousands of WA farmers will look to growing trees as part of their farm operation. He said returns were similar to grazyear at 2,000 hectares, with 5,000 hectares next year and a similar level for another decade.

Two weeks ago, the State Government launched a tree trust — a 20-year, $325 million program to plant more than 100 million trees to "green" the south-west. According to the Conservation and Land Management Department, a new industry could be established through tree planting on cleared agricultural land to generate $400

million in export income in 10 years.

The department put Australia's import bill for forest products at $1.7 billion, with countries like South Africa, Brazil, Spain, Chile and Portugal reaping the benefits from establishing more than three million hectares of highly productive eucalyptus plantations, compared with Australia — home of the genus — with only 40,000 hectares.

Michael Zekulich

[West Australian, October 17 1988]

HORTICULTURAL INDUSTRIES COULD BE REGULATED

Horticultural industries in WA will be regulated under legislation introduced last week in Parliament. The Horticultural Produce Commission Bill 1988 provides for the establishment of a horticultural produce commission and growers' committees.

The Minister for Planning, Mr Pearce — who introduced the legislation on behalf of the Minister for Agriculture, Mr Grill — said horticultural producers had performed well against highly-organised international markets in recent years.

Horticultural exports had increased from $25 million to $39 million in the three years to the end of the last financial year. In the same period the gross value of fruit, vegetable and flower production had increased $60 million. Scope for export expansion was great.

The unique character of the State's wildflowers presented enormous potential to commercialise a range of species. The vegetable industry had made a remarkable contribution on some markets in South-East Asia. A scheme was needed in WA where willing horticultural industries could contribute money on a fee-for-service basis, he said.

Debate was adjourned.

WELCOME TO NEW EXECUTIVE COMMITTEE MEMBERS

WANATCA welcomes new members of the Executive Committee, Alex Hart and Amos Machlin.

Long-time member Alex Hart recently retired from a distinguished career with CALM (formerly the Forestry Department) and he brings to the Committee a wealth of experience in tree husbandry.

Amos Machlin has created W.A.'s foremost pecan orchard, and also important plantings of macadamias, pistachios and avocados. He is the State's leading processor of locally grown nuts.

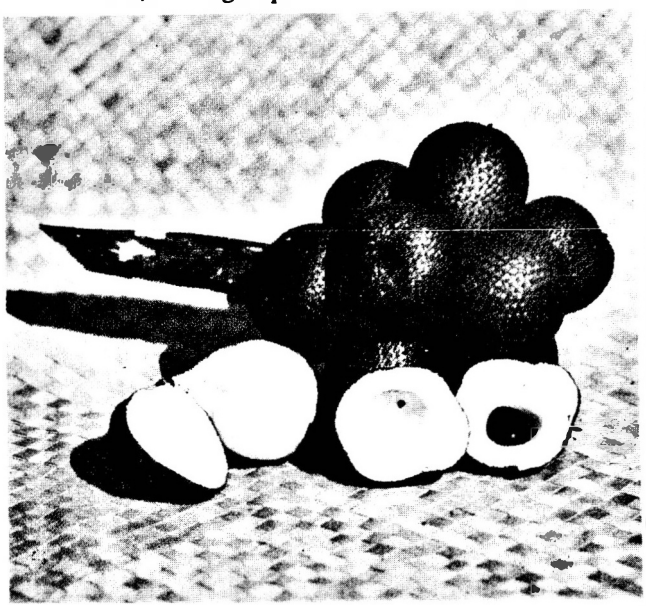
Thank you both for your willingness to help the Association in this way.

[Rare Fruit Council International leaflet]

THE SALAK PALM

The salak (*Salacca edulis*) is indigenous to the Asiatic tropics, where it is extensively grown for local consumption. The fruit of this small, spiny, pinnate-leaved palm is held in high esteem and considered one of the finest of all palm fruits for eating out of hand. The rich yellow-white meat is slightly crisp with a delicate, delicious blend of acidity and sugars.

The salak is usually dioecious so that both male and female plants are required for fruiting. An exception to this occurs on the Island of Bali where the palm is monoecious, making it possible for each plant to bear. The young palms are set out 1.5 metres apart and require about 30 to 50% shade. Fruiting can commence in three to five years from seed, with each palm bearing 6 to 10 bunches of fruit annually.



On Bali there are two bearing seasons. The main one, with the largest and best fruit, occurs in February, followed by a smaller crop in August. Fruit brought 375 rp. per kilo (41 cents US per pound) during August in the local markets of Denpasar. One can consume only about four to five of these filling two-inch diameter fruit at a time.

The scaly, chocolate-brown skin is thin, tough and crisp but can be easily removed. The pulp normally contains a single hard, brown seed which is viable for ten days after removal from the fruit. For the market fruit is picked to last a week, but once dead-ripe commences to spoil after the fourth day.

The most delicious of all salak are found on Bali where the different strains are identified by odour. The 'Gondak' variety has a sweet smell like the Bali gondak flower. 'Nangka' is a slightly smaller fruit with a darker skin but the same taste as 'Gondak' ("Nangka" is the Balinese word for jakfruit). 'Lipan' is a scarce, hard-to-find poor variety that makes a small fruit with red lines on the flesh ("Lipan" means centipede in Bali).

The salak palm can reach 12 feet or more in height, although fruiting occurs on much shorter plants. The older palms sprawl along the ground and appear to live on indefinitely

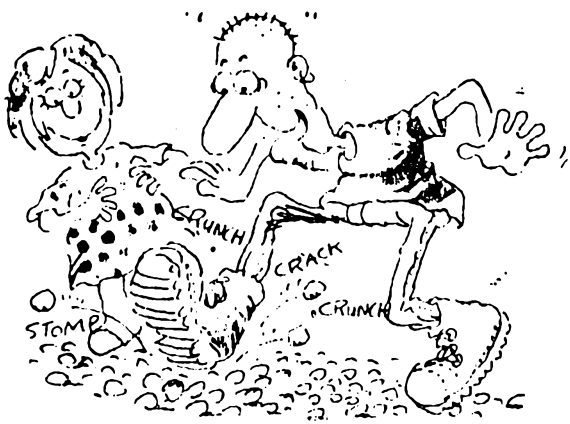
by generating new trunks as their trailing ends disintegrate with age. Young salak sucker profusely but this ceases as the plant matures. When these suckers are removed from the parent plant and potted up, they frequently die.

In Southern Florida the salak appears to grow well on calcareous limestone soils and withstand winter cold in the warmer locations. Plants have been grown in Dade County for a long time but have not fruited, probably because they were dioecious. The fruit contains sugars, vitamin C and potassium. In the Asiatic tropics 200,000 fruit or more per acre can be produced annually by a good grove.

William F Whitman

["Mere Male", New Idea, December 12 1987]

HOME ALMOND-SHELLING TIP



How I hated the yearly task of shelling the almond harvest. Each year I would sit on the floor with the crop spread before me, shelling the almonds.

Then one night I said: "Oh, my poor nails. How I hate this job."

"I'll do it," my son said. He left the room and returned wearing his hiking boots. MM then proceeded to walk all over the almonds. Result: only two broken kernels and no split nails!

A.K., Marlins Beach, S.A.

KEN'S PILBARA NEWS-FLUSH

Well, Tropical Cyclone Ilona has been and gone, heaps of rain and wind knocked my "more" advanced *Terminalia catappa* around a bit, nothing a few star pickets wouldn't fix and a bit of light pruning to take a bit of weight out of the top. Ilona's rain was really good for the growth up here, but her wind burns the hell out of everything. Takes a while for everything to get their 'gloss' back again and the weeds that have now arrived — even Round-up won't kill them.

Neem trees, *Azadirachta indica*, are one of the best kept secrets. The potential of them we don't even know about as yet. The ones up here are yelling out, "Give me another cyclone", and when somebody leaves the trickle line off for a week they can also handle it — one will have to keep an eye on them alright.

The figs, Brown Turkey, well you had to be quick, especially if you had a early morning snack in mind. They finished about Xmas but I see now there's another flush. Guavas, pink and white, fruiting at the moment. I prefer the white (inside) ones. Smell like perfume — the taste, well they are not big enough!

I came across what I believe to be some Desert Walnuts, *Owenia reticulata*, a little before Xmas. I used to like eating walnuts. But hang on a minute though, it's a beautiful tree, perfect for up here in this neck of the woods. Nice looking tree, the nut shell is as hard as hell so gives you a bit of time to get to them when lying on the ground before the termites, ants, etc. do. I'm going to have a go at propagating from seed, I already have, but think my seeds were too fresh.

Theres also some Native Almonds, *Terminalia canescens* , around these parts which I hope to track down soon. My superiors have got this thing about native plants. Little do they know that their idea and my idea of natives ring a slightly different bell — not too many mad tree croppers living in the Pilbara, I'm afraid.

I've got some seeds of *Santalum acuminatum* ,'Quandong'. Haven't I heard that name somewhere before? And if they taste something like 'Black Guava', well here we go.

I'm looking forward to the 1989 Seed Distribution, interesting trying out different plants up here in the 'bush'. Well I must away and eat my home grown big fat juicy paw paw for breakfast.

Ken Herivel, PO Box 270, Wickham 6720

PECANS — OUR LATEST ACTION GROUP

Our fifth Action Group is to be led by Amos Machlin, the State's leading grower of this nut crop.

Pecans are one of the most promising nut crops for southern W.A., and the Association is fortunate to have access to Amos' expertise in this rapidly developing area.

For contact details, refer to 'Action Group Leaders' on the back cover of Quandong.

Letter from Germany:
THE HONEY LOCUST

The main problem in crop trees here is still the Honey Locust, Gleditsia triacanthos, and I could not walk a meter in any direction for a success in this point. There are some notes on heavy fruiting cultivars put out by the Arnold Arboretum of Harvard University, and in addition the US National Arboretum, Washington, but the nursery selecting all these cultivars does not exist any more. Stephen Spongenberg from Arnold wrote me, that I may contact Frank Santamour of the National Arboretum, who seems to be at the moment the head of honey locust research and the genus Gleditsia. All I hope is, that he will help me and I have asked my friend Dr. Egolf of the National Arboretum Washington, the 'viburnum pope', to talk on this matter with Santamour.

It seems that you published my needs in your journal 'Quandong', and I got two wonderful letters: One from Australia (Ivan Laszlo) and the other from New Zealand (Tom Dinning). Both are a great help for me. I am deeply impressed by the help of people around the world.

In the meanwhile, it is quite clear that three or four cultivars of honey locust will bear heavy crops, and Trevor Lennard, Te Puke tree cropper of New Zealand, is of the opinion (Growing Today June/July 1985), that the crops can be up to 500 kilos/tree. In addition, I found from advertisements in that journal which cultivars are available.

I am still looking for a nursery in the US, and the reason is only that USA has the same summer/winter rhythm as we in Europe. Additionally, there are restrictions in import of trees. Import of trees into Europe is only allowed during the time starting 1st of October and ending 30th of April. The trees should be without leaves. If I cannot succeed in the US, I will try to import some grafted seedlings from Australia or New Zealand and I feel, that the problem will not be the different rhythm in seasons, but to get plants still before 30th of April without leaves to Germany.

All I hope is that the grafted trees will bear fruits within two or three years, so that we can check whether the fruits are of the same quality as in Australia, New Zealand and USA, because we do not have as much sunshine and warmth as in these countries. This can lead to a much lower content in sugar, oil and proteins, which is in my opinion an advantage for wildlife. All game seems to be eager for pods of honey locust and honey locust needs no fertilizer, which poisons our drinking water and is free of pesticides too, which are becoming a great problem now in our country.

Walter Griesmeir,
Frauenstrasse 18, D-8930 Schwabmünchen, West Germany

[West Australian, July 27 1988]

ENJOY THE TASTE OF CHERIMOYA

Almost anywhere in the Latin American or Caribbean countries, the traveller may see a peasant woman trudging along the road with a heavy basket of fruit on her head or back.

The basket may contain nothing but the universally familiar green bananas or avocados. But it may also be the carrier for a cornucopia of strange and delicious sweet and exotic tropical fruits. One such fruit is the cherimoya, of the custard apple species. Together with the less sweet sour sops, they belong to the Annona family.

All of the Annona family species, such as cherimoya, sour sop and custard apple, can be easily recognised by their special features — heavy, solid heart-shaped fruit with greenish brown or greenish yellow skin covered with raised bumps. The flesh is pure white and contains shiny black seeds that are easily separated in the same way as watermelon seeds. Their white pulp suggests "sops" — a name once used to describe bread soaked in milk. But the flavour is very like sweet, juicy pears lightly flavoured with cinnamon.

We in WA can now experience the delights of the custard apple — something which was formerly only enjoyed by people in the Eastern States. Though the custard apple looks like a leathery, fat, green pine-cone, do not be deceived by its appearance.

The fruit requires careful handling to prevent bruising. It is picked when mature but not ripe and should be kept at room temperature until soft, when it is ready to eat. The lovely custard inside also contains very smooth black seeds. Some say that these should be discarded while others suggest that the seeds should be savoured in the mouth before being disposed of. The seeds are quite large and shiny.

The pulp can also be sieved to get rid of the seeds and be made into desserts or drinks. Add cream, sugar or a squeeze of lemon or lime juice to the pulp and use as an ice-cream mixture or the basis of a chilled souffle. The pulp can also be a natural sauce and spooned over strawberries or ice cream or in a fruit salad combination.

The fruit is available from now until September, so there is opportunity to assess the merits of this exotic fruit. The custard apple enhanced all fruits, nuts, cream cheese and cream, and I include here a Cherimoya and Banana Filling as an innovative filling for sponge cakes or a pavlova.

Cherimoya and Banana Filling

In a bowl, mash together:

1 cherimoya, seeds removed
2 bananas
1 tspn lemon juice
2 tspns icing sugar
1 cup whipped cream.

Joy Sparrow

[NSW Dept. Agriculture leaflet]

OLIVES IN THE GARDEN

The olive, *Olea europea*, is an evergreen tree that grows up to 8 metres high. It is a native of the Mediterranean region.

The tree will bear fruit from about five years of age and can continue producing for centuries.

Olive trees produce most of their fruit on shoots arising from the previous year's wood, and usually bear heavier crops every second year. The fruits are either pickled in brine or pressed for olive oil.

Varieties

Mezanillo and Verdale are suitable varieties for both green and ripe pickling. They have relatively high winter chilling requirements so cannot be grown where winters are too mild. Sevillano is suitable for green pickling only, and needs longer periods of winter chilling than the other two varieties for good fruit production.

Location

Olives have very definite climatic requirements: they need cold winters and long hot summers to produce mature, good-sized fruits. Coastal areas are generally too warm to provide sufficient winter chilling for good flower production and fruit set.

Olives are fairly shallow-rooting plants. However, because of their narrow leaf surface thay are fairly drought tolerant. They require well-drained soils and have a higher tolerance to alkaline and saline soils than other horticultural crops. Avoid poorly drained soils as these encourage root rots.

Spring flowers may be damaged by late frosts in highland areas.

Propagation

Olives are usually propagated by budding or grafting onto seedling rootstocks. Budding is done in autumn and grafting in spring.

Olives can also be propagated from hardwood and tip cuttings.

Planting and Caring

Olives can be planted any time from autumn to spring.

Take care to keep roots moist during transplanting. Set each plant at its former level in the planting hole and partially fill with soil. Hold the plant in position, add water, and allow it to soak in before filling the hole with soil.

Water well over the first summer to encourage the development of a good root system.

Nutrition

Olives need a dressing of a 10:4:6 fertilizer (e.g. citrus fertilizer) each winter before the end of August. Apply this at the rate of 500 grams per year of age until the tree is ten years old, then continue to apply at the ten

year rate. Spread the fertilizer evenly around the tree but do not let it accumulate around the trunk.

Late winter mulching will provide essential elements in spring and conserve moisture over the growing season. Avoid using high nitrogen mulches such as grass clippings as these will aggravate biennial bearing (heavy cropping every second year).

Pruning Hints

- If you are pruning to encourage new growth, make cuts just above an outward pointing bud or shoot.
- Cut out *all* dead or diseased material; don't leave stubs.
- Remove crowded or crossed branches.
- Paint cuts larger than 2 cm across with a bituminous wound dressing.

Pruning

Olives need little pruning other than that required to open up the centre of the tree and check vigorous growths. Remove any crossed limbs and upright shoots from the centre, and encourage outward growths. An open centre allows better control of brown olive scale.

Harvesting

Harvest fruits for green pickling when mature but not coloured; the skin can vary from green to pale straw. Fruits for ripe pickling are harvested when firm and dark blue or purple in colour.

Handle the fruit carefully as bruised fruit does not pickle well.

Pests and Diseases

Brown olive scale is the most common insect pest. In some inland areas olive lace bug can be a serious pest, causing defoliation of trees.

HODGSONIA SEED IN W.A.

We have recently been fortunate in getting a small supply of seed of Hodgsonia vines from China. Hodgsonia is a perennial vine in the melon family which produces huge seeds (10 cm long) rich in an edible oil resembling walnut oil.

The seeds were supplied by Professor Ban Yang Huang of the South China Institute of Botany in Canton. Professor Huang is currently in Australia, working on a project with the New South Wales Department of Agriculture.

[The Fruit Gardener, Vol. 20, No. 1, First Quarter 1988]

THE STONE PINE

A tree of many uses

The pine nut, known as Pinus pinea, is also called the 'Stone Pine" and sometimes the "Umbrella Pine". These names apparently came from the idea that this tree grows well in stony ground and also at times it has a shape rather like an umbrella. The seed/nut has the outward appearance of a small stone. The tree has many uses and is a very important plant in Italy, Spain and Portugal.

As Shelter Belts — The tree can stand strong winds and salt sea air. Once established, it tolerates both dry and wet conditions. The trees develop low branches that remain green all their life. The strong tap root on this species will grow through heavy soils and helps when there is competition for water.

For the Nuts — The Pine nuts imported into New Zealand at the moment are well known for use in cooking, salads, confectionery, and are nice eaten raw. Trees start to bear a crop of nuts when about 10 years old and this means that a shelter belt can give an extra income. Each cone holds about 50 nuts and 100kg. of cones holds about 20 kg. of nuts. The annual yield of nuts per hectare is about 500kg.

Harvesting is done by means of a hook on a long pole. This is used to pull the cones off the tree. The cones are then spread out on plastic or concrete in the sun. They open up and the nuts fall out.

As Erosion Control—The trees are very useful for erosion control on coastal areas as they can tolerate the salt winds. They will grow in sand as well as clay or peat. They will stand very hot summers and also cold down to 23°C. below freezing. During 1985, Italy had one of the coldest winters for many years. Large orchards of olives died, but there was no sign of any decline in pine nut trees.

For Resin — This is not likely to be of

great value in New Zealand, because a large number of trees are needed to make resin production worthwhile. An interesting fact is that, when a tree is tapped for resin, the nut production goes up for a few years and then decreases sharply. This decrease continues even if the tapping stops. Sawmills will not accept P. pinea trees that have been tapped because of the likelihood of nails and other pieces of metal that may be left in the tree.

For Timber — As the branches start low to the ground, these can become large if left unpruned. This may be altered if the trees are planted close together.

There is a difference of opinion as to the value of the timber. In Italy it is used for pallets and packing material, but in Portugal where there is a shortage of timber, it is used for many purposes.

Recreation — As these trees do well in sand, they can be planted near beaches and in parks. They give very good shade when the lower branches are pruned and the tree grows into an umbrella shape.

Both in Italy and in Portugal, owners of blocks of P. pinea trees near a beach have several incomes from them. There are the nuts, the resin, and they often charge a fee for visitors to park their cars under these trees. Some of these places are used as caravan and holiday camps in the summer.

Culture — Some problems occur with growing the seedlings. The optimum temperature for seed germination is 17-19°C. Any temperatures above 25°C. can inhibit movement and below 10°C. often causes a type of dormancy.

Best results come from planting in coarse river sand or pumice with about 25% moisture. If it is too wet, the seed will rot. It is necessary to add mycorrhizal fungus gathered from under a stand of any other pine trees. This is very important because, without it, you are unlikely to get any growth from your P. pinea. Very little is needed and the mycorrhizal fungi not only help to feed the young tree but give protection against too wet or too dry conditions.

Once seedlings are up, do not overwater, thus causing rotting. Once the nut shell has fallen off, transplant the seedling into deeper containers. The tap root will already be quite long and, if this is broken, the young tree can have something of a setback. When the seedling has reached a height of about 10cm. overwatering is no longer a danger.

Grafting — Work is still being done in Italy on propagation. People are attempting to get trees with more cones and better nuts. The types of grafting normally done are cleft graft and veneer side graft. The cleft graft seems to be the more favoured and the favourite time is mid-summer. The rootstock must be more than 18 months old, otherwise delayed mortality occurs in two years after grafting.

Apart from Pinus pinea, other rootstocks that can be used include P. radiata (80-85% success), P. halepensis and P. sabiana (60-70%) and somewhat lower with P. pinaster (20-50%) success.

Pinus pinaster is considered a very important tree in Italy, but you will not find many of them in New Zealand. It has been important and the Forest Research Institute has some plantings of this species.

I wish to record my gratitude to both the Italian and Portuguese governments who gave me a lot of information and books.

Louis Trap.

[Countryman/May 12, 1988]

BERRY WINES TEMPT THE TASTE BUDS

The Berry Farm of Margaret River has 'value added' farm products by turning excess and downgraded fruit to wines, james and vinegars.

The wines, from fresh kiwifruit, raspberry, strawberry and boysenberry, are believed the first of their type in Western Australia.

Owners Eion and Andrea Lindsay are hopeful the range will be readily accepted.

"They're not sweet and thick as many people suppose — they have a fruity flavour," Eion said.

The kiwi fruit wine stood out for this writer as a fresh, light-bodied wine.

The boysenberry wine is fortified.

All wines are available through cellar door facilities at the Berry Farm, or through McHenry, Dunstan and Hurley branches in Perth. Mail order is also available.

The vinegars, matured in barrels in a below ground cellar, are made from raspberries, strawberry, blackcurrant and boysenberry. Already, interest from the Eastern States is being shown in the vinegars.

Eion is confident the range will provide chefs, retailers and the general public with a greater choice and range of vinegars, with characteristics which have been missing from the market.

The Berry Farm's main sources of production are a 35,000 plant strawberry plot and a 4 ha kiwi fruit grove.

Visitors to the farm could pick fruit in season and shouldn't miss the opportunity of dining at Berry Farm cottage. Andrea serves an assortment of meals or Devonshire teas and caters for all age groups.

The jams - raspberry, blackberry, kiwi fruit, boysenberry and blackcurrent - sell for $3 a pot. The wine is $9.50 a bottle. "One of the pleasing aspects is the number of people who return," Andrea said.

Richard Piggott

WANATCA INFORMATION LEAFLET REVISED

Our information leaflet, 'Growing Nuts, Exotic Fruits, and other Tree Crops in Western Australia', has been reset and revised in a new issue.

The Leaflet includes a general review of the tree crop projects in W.A., a map of growing zones, and zone recommendation tables for various nuts, fruits, and fodder trees.

It also gives details about WANATCA membership and the activities of the Tree Crop Centre.

Free copies are available from the Secretary, Lorna Budd, or from the Tree Crops Centre.

West Australian Nut & Tree Crop Association (Inc)

PO Box 565 Subiaco WA 6008 Australia

EXECUTIVE COMMITTEE 1989

David Noel (President)	386 8093(W) 381 7341(H)	Amos Machlin	444 4609
Milan Mirkovic (Vice-President)	420 2341	Bill Napier	399 6683(H)
Lorna Budd (Secretary-Treasurer)	458 5918	Alex Sheppard	420 2341(W); 446 2316(H)
David Turner (Yearbook Editor)	380 2415(W) 387 6057(H)		
Don Findlay	362 5744(W) 458 2468(H)	Neville Shorter	367 7879
Alex Hart	490 1324		

ACTION GROUP LEADERS

CHERRY: Neville Shorter, 367 7879 (62 Preston Street, Como 6152)
JUJUBE: Ian Fox, 450 3146/H, 380 2571/W (42 Bradshaw Cres, Manning 6152
PECAN: Amos Machlin, 444 4609 (38 Hartwell St, Mt Lawley 6050)
PISTACHIO: Tom Bateman, 401 8138 (4 Lygnern Cres. Kallaroo 6025)
POMEGRANATE: Marius Loeffler, 097-33 5220 (P.O. Box 22, Yarloop 6218)

CALENDAR OF FORTHCOMING EVENTS

1989		
Feb 15	Wed	*General Meeting (Video Night)
Mar 12	Sun	Field Day: Stoneville Fruit Research Station
Apr 18	Tue	Executive Committee Meeting
May 13-15		§ NZTCA Conference, Malborough, New Zealand
May 17	Wed	*General Meeting (Moore: Agroforestry in China)
May 28	Sun	Field Day: David Noel's Garden
Jul 18	Tue	Executive Committee Meeting
Aug 16	Wed	*General Meeting
Sep 25-29		§ 3rd International Mango Symposium, Darwin
Sep 30-Oct 7		Royal Show, Claremont
Oct 17	Tue	Executive Committee Meeting
Nov 15	Wed	*Annual General Meeting
Nov 26	Sun	Field Day: Lynn-Robinson Macadamia Orchard, Chittering
1990		
Mar/Apr		Australian Pistachio Symposium, Muresk

*General Meetings are held at the Naturalists Hall, 63 Meriwa Street, Nedlands, startingat 7.30pm. These meetings usually include a plant auction and current magazine display.
§ For contact details refer to the Tree Crops Centre

Current Subscription Rate: $30.00 per year
(includes all publications for the year). Student Rate: $15.00

Quandong is produced at the Tree Crops Centre, Suite 8, 88 Broadway, Nedlands. Mail Address: PO Box 27, Subiaco, WA 6008. Phone: 09-386 8093. Fax: 09-386 7676.
Advertising Rates: Whole page, $80; Half page, $45; Quarter page, $25; Eighth page, $15. Small advertisements, $1 per 5 words. 20% discount for 4 insertions